In the Claims:

Please cancel claims 2, 6, 10, 14 and 18, without prejudice, amend claims 1, 3-5, 9, 11-13 and 17, and add new claims 21-24 as follows:

1.   (Currently Amended)   An apparatus for reading a recording medium, comprising:

a determining unit that determines whether an error detected by using an error correcting code is correctable with respect to a signal sequence read from the recording medium; ~~and~~

a decoding unit that performs maximum a posteriori decoding of the signal sequence upon the determining unit determining that the error is not ~~correctable.~~correctable;

an internal code decoder that calculates a first reliability information and an external information; and

an external code decoder that calculates, based on the external information, a second reliability information with respect to a maximum a posteriori decoding sequence to output the maximum a posteriori decoding sequence based on the second reliability information calculated, wherein

the decoding unit performs maximum a posteriori decoding of the signal sequence by repetitively using the internal code decoder and the external code decoder until a repetition end condition is satisfied.

2

2.   (Canceled)

3.   (Currently Amended)   The apparatus according to claim ~~2,~~1, wherein

the internal code decoder is a BCJR decoder, and

the external code decoder is an LDPC decoder.

4.   (Currently Amended)   The apparatus according to claim ~~2,~~1, wherein

the internal code decoder is a decision aided equalizer decoder, and

the external code decoder is a turbo decoder.

5.   (Currently Amended)   ~~The apparatus according to claim 1,~~An apparatus for reading a recording medium, comprising:

a determining unit that determines whether an error detected by using an error correcting code is correctable with respect to a signal sequence read from the recording medium;

a decoding unit that performs maximum likelihood decoding of the signal sequence upon the determining unit determining that the error is not correctable, wherein the decoding unit includes

a Viterbi decoding unit that outputs a Viterbi decoding sequence by performing maximum likelihood decoding based on Viterbi decoding of the signal sequence; and

a noise estimate post processing unit that creates a filter passing sequence by filtering the Viterbi decoding sequence based on a channel signal characteristic and a channel noise characteristic, and that performs an error correction of the Viterbi decoding sequence by using the filter passing sequence and the signal sequence.

6.   (Canceled)

7.   (Original)   The apparatus according to claim 1, further comprising:

a syndrome generating unit the generates a syndrome based on a check matrix of the error correcting code and the signal sequence, wherein

the determining unit determines whether the error is correctable by using the syndrome generated.

8.   (Original)   The apparatus according to claim 7, wherein the error correcting code is a Reed-Solomon code.

9.   (Currently Amended)   A method for reading a recording, comprising:

determining whether an error detected by using an error correcting code is correctable; and

performing maximum a posteriori decoding of a signal sequence read from the recording medium upon determining that the error is not ~~correctable.~~correctable; wherein

the maximum a posteriori decoding of the signal sequence is performed by repetitively using an internal code decoder and an external code decoder until a repetition end condition is satisfied, wherein

the internal code decoder calculates a first reliability information and an external information, and

the external code decoder calculates, based on the external information, a second reliability information with respect to a maximum a posteriori decoding sequence to output the maximum a posteriori decoding sequence based on the second reliability information calculated.

10.   (Canceled)

11.   (Currently Amended)   The method according to claim ~~10,~~9, wherein

the internal code decoder is a BCJR decoder, and

the external code decoder is an LDPC decoder.

12.   (Currently amended)   The method according to claim ~~10,~~9, wherein

the internal code decoder is a decision aided equalizer decoder, and

the external code decoder is a turbo decoder.

13.   (Currently Amended)   ~~The method according to claim 9,~~A method for reading a recording, comprising:

determining whether an error detected by using an error correcting code is correctable; and

performing maximum likelihood decoding of a signal sequence read from the recording medium upon determining that the error is not correctable; wherein

the performing includes

outputting a Viterbi decoding sequence by performing maximum likelihood decoding based on Viterbi decoding of the signal sequence;

creating a filter passing sequence by filtering the Viterbi decoding sequence based on a channel signal characteristic and a channel noise characteristic; and

performing an error correction of the Viterbi decoding sequence by using the filter passing sequence and the signal sequence.

14.   (Canceled)

15.   (Original)   The method according to claim 9, further comprising:

generating a syndrome based on a check matrix of the error correcting code and the signal sequence, wherein

the determining determines whether the error is correctable by using the syndrome generated.

16.   (Original)   The method according to claim 15, wherein the error correcting code is a Reed-Solomon code.

17.   (Currently Amended)   A hard disk controller used in an apparatus for reading a recording medium, comprising:

a determining unit that determines whether an error detected by using an error correcting code is correctable with respect to a signal sequence read from the recording medium;

a decoding unit that performs maximum a posteriorilikelihood decoding of the signal sequence, upon the determining unit determining that the error is not correctable;

a correcting unit that detects an error by using the error correcting code with respect to the signal sequence, and corrects the detected error; and

a checking unit that checks whether the error correction by the correcting unit is correct.correct; wherein

the decoding unit includes

a Viterbi decoding unit that outputs a Viterbi decoding sequence by performing maximum likelihood decoding based on Viterbi decoding of the signal sequence; and

a noise estimate post processing unit that creates a filter passing sequence by filtering the Viterbi decoding sequence based on a channel signal characteristic and a channel noise characteristic, and that performs an error correction of the Viterbi decoding sequence by using the filter passing sequence and the signal sequence.

18.   (Canceled)

19. (Original) The hard disk controller according to claim 17, wherein the decoding unit includes

a noise estimate Viterbi decoding unit that performs a Viterbi decoding using channel information based on a channel signal characteristic and a channel noise characteristic, wherein

the decoding unit performs maximum likelihood decoding of the signal sequence by Viterbi decoding.

20. (Original) The hard disk controller according to claim 17, further comprising:

a syndrome generating unit the generates a syndrome based on a check matrix of the error correcting code and the signal sequence, wherein

the determining unit determines whether the error is correctable by using the syndrome generated.

21. (New) The apparatus according to claim 5, further comprising:

a syndrome generating unit the generates a syndrome based on a check matrix of the error correcting code and the signal sequence, wherein

the determining unit determines whether the error is correctable by using the syndrome generated.

22. (New) The apparatus according to claim 21, wherein the error correcting code is a Reed-Solomon code.

23. (New) The method according to claim 13, further comprising:

generating a syndrome based on a check matrix of the error correcting code and the signal sequence, wherein

the determining unit determines whether the error is correctable by using the syndrome generated.

24. (New) The method according to claim 23, wherein the error correcting code is a Reed-Solomon code.